JC19 Rec'd PCT/PTO 3 1 MAY 2001

FORM PTO-1390 (Modified) (REV 11-2000) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371	L9289.01145
	U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 09/857030

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/JP00/06973	**October 6, 2000**	**October 7, 1999**

TITLE OF INVENTION

RADIO COMMUNICATION APPARATUS AND TRANSMISSION POWER CONTROL METHOD

APPLICANT(S) FOR DO/EO/US

Katsuhiko HIRAMATSU

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include itens (5), (6), (9) and (24) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☐ is attached hereto (required only if not communicated by the International Bureau).
   b. ☒ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. ☒ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☒ A copy of the International Search Report (PCT/ISA/210).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☐ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☐ Certificate of Mailing by Express Mail
23. ☒ Other items or information:

    Claim for Priority with PCT/IB/304
    PCT/IB/308
    PCT/RO/101

JC18 Rec'd PCT/PTO 31 MAY 2001

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 09/857030	INTERNATIONAL APPLICATION NO. PCT/JP00/06973	ATTORNEY'S DOCKET NUMBER L9289.01145

24. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS	PTO USE ONLY
☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO	**$1000.00**		
☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO	**$860.00**		
☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	**$710.00**		
☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4)	**$690.00**		
☐ International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4)	**$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =		**$860.00**	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).		**$0.00**	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	14 - 20 =	0	x $18.00	**$0.00**	
Independent claims	6 - 3 =	3	x $80.00	**$240.00**	
Multiple Dependent Claims **(check if applicable).**			☐	**$0.00**	
TOTAL OF ABOVE CALCULATIONS =				**$1,100.00**	
☐ Applicant claims small entity status. (See 37 CFR 1.27). The fees indicated above are reduced by 1/2.				**$0.00**	
SUBTOTAL =				**$1,100.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). +				**$0.00**	
TOTAL NATIONAL FEE =				**$1,100.00**	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).**			☒	**$40.00**	
TOTAL FEES ENCLOSED =				**$1,140.00**	
				Amount to be: refunded	$
				charged	$

a. ☒ A check in the amount of **$1,140.00** to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. ______ in the amount of ______ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. **19-4375** A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

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NAME

28,732

REGISTRATION NUMBER

May 31, 2001

DATE

09/857030
JC18 Rec'd PCT/PTO 31 MAY 2001

DESCRIPTION

RADIO COMMUNICATION APPARATUS AND TRANSMISSION POWER CONTROL METHOD

Technical Field

The present invention relates to a radio communication apparatus and a transmission power control method, which are used in a radio transmitting system such as a mobile phone, a cellular phone and the like.

Background Art

In a radio transmitting system such as a mobile phone, a cellular phone and the like, an SIR (Signal to Interference Ratio) is fixed and transmission power control is carried out in accordance with the state of each transmission channel in order to maintain a BER (Bit Error Rate) at a value below a predetermined value.

The transmission power control method includes a closed loop transmission power control and an open loop transmission power control.

The closed loop transmission power control is a method for controlling transmission power based on the contents of a TPC (Transmit Power Control) command where SIR corresponding to reception quality of a transmitting signal from one end is measured at the other end of communication and the

TPC command, which reduces transmission power when a measured SIR value is higher than a target SIR value and which increases transmission power when the measured SIR value is lower than the target SIR value, is transmitted through an inverse channel.

On the other hand, the open loop transmission power control is a method for controlling a transmission power value in such a way that a reception level is subtracted from the known transmission level of the other end of communication to calculate a level lost in a radio section and a target reception level of the other end of communication is added to the lost level.

Here, data communication in which the information amount of a forward link is greatly larger than that of a reverse link is expected to be mainstream in the future, and the development of a radio communication system of asymmetrical communication where the information amount of the reverse link is asymmetrical with respect to that of the forward link is proceeding.

In the case of the radio communication system where the information amount of the reverse link is symmetrical with respect to that of the forward link, since a time difference between transmission timing and reception timing is small, transmission power can be controlled for each slot with high accuracy.

However, in the radio communication system

that performs asymmetrical communication where a time difference between transmission timing and reception timing becomes large, a method for controlling transmission power for each slot with high accuracy has not been disclosed yet.

Disclosure of Invention

It is an object of the present invention to provide a radio communication apparatus and a transmission power control method capable of controlling transmission power for each slot with high accuracy in asymmetrical communication.

The above object can be attained by averaging desired signal power over a plurality of slots to reduce a power error in desired signal power in the respective slots and to improve precision of measurement.

Brief Description of Drawings

FIG. 1 is a block diagram illustrating the configuration of a radio communication apparatus according to a first embodiment of the present invention;

FIG. 2 is a block diagram illustrating the configuration of a radio communication apparatus as a communication partner with respect to the radio communication apparatus of the first embodiment of the present invention;

FIG. 3 is a block diagram illustrating the configuration of a radio communication apparatus according to a second embodiment of the present invention; and

FIG. 4 is a block diagram illustrating the configuration of a radio communication apparatus as a communication partner with respect to the radio communication apparatus of the second embodiment of the present invention.

Best Mode for Carrying Out the Invention

Embodiments of the present invention will be specifically explained with reference to the drawings accompanying herewith.

(First embodiment)

The first embodiment explains the case of the closed loop transmission power control. FIG. 1 is a block diagram illustrating the configuration of a radio communication apparatus according to the first embodiment of the present invention.

A duplexer 102 switches a channel through which a signal passes at a transmitting time and a receiving time and outputs a signal received from an antenna 101 to a reception RF circuit 103, and outputs a transmitting signal outputted from a transmission RF circuit 112 to the antenna 101.

The reception RF circuit 103 amplifies the received signal, frequency-converts the amplified

signal to a baseband, and outputs the resultant to a demodulating circuit 104. The demodulating circuit 104 demodulates the baseband signal to extract received data of the radio communication apparatus.

A desired signal power measuring circuit 105 measures reception power (hereinafter referred to as "desired signal power") of a known signal included in the output signal of the demodulating circuit 104, and outputs a measuring result to an averaging circuit 106. The averaging circuit 106 calculates an average value of desired signal power in a plurality of slots, and outputs the average value to an SIR measuring circuit 108.

Here, in the case where a known signal sequence is long and an interference signal can be suppressed and the slots are close to each other and variations in reception power due to fading is small, desired signal power in the respective slots is substantially equal to each other. Accordingly, the calculation of the average value of desired signal power in the respective slots makes it possible to improve accuracy of measurement in desired signal power.

An interference signal power measuring circuit 107 measures power of an interference signal outputted from the demodulating circuit 104,and outputs a measuring result to the SIR measuring

circuit 108.

The SIR measuring circuit 108 calculates SIR(n)(n indicates slot number) of each slot from the average value of desired signal power in the plurality of slots and the measured value of interference signal power of each slot, and outputs the resultant to a TPC generating circuit 109.

The TPC generating circuit 109 makes a comparison between SIR(n) of each slot and a threshold value, and generates transmission power control information, which instructs the slot whose SIR(n) is lower than the threshold value to increase transmission power, and generates transmission power control information, which instructs the slot whose SIR(n) is higher than the threshold value to reduce transmission power. After that, the TPC generating circuit 109 outputs generated transmission power control information of each slot to a multiplexing circuit 110.

The multiplexing circuit 110 multiplexes a plurality of pieces of transmission power control information into one slot transmitting data and outputs the resultant to a modulating circuit 111. The modulating circuit 111 modulates an output signal of the multiplexing circuit 110, and outputs the modulated signal to a transmission RF circuit 112. The transmission RF circuit 112 converts the frequency of an output signal of the modulating

circuit 111, amplifies transmission power, and transmits the amplified transmission power as a radio signal from the antenna 102 through a duplexer 102.

FIG. 2 is a block diagram illustrating the configuration of a radio communication apparatus as a communication partner with respect to the radio communication apparatus of FIG. 1.

A duplexer 202 switches a channel through which a signal passes at a transmitting time and a receiving time and outputs a signal received from an antenna 201 to a reception RF circuit 203, and outputs a transmitting signal outputted from a transmission RF circuit 208 to the antenna 201.

The reception RF circuit 203 amplifies the received signal, frequency-converts the amplified signal to a baseband, and outputs the resultant to a demodulating circuit 204. The demodulating circuit 204 demodulates the baseband signal and outputs the demodulated signal to an isolating circuit 205. The isolating circuit 205 isolates an output signal of the demodulating circuit 204 into received data and transmission power control information.

A CL (Closed Loop) transmission power control circuit 206 controls an increase or decrease in transmission power at the transmitting FR circuit 112 based on transmission power control information

isolated at the isolating circuit 205.

A modulating circuit 207 modulates transmitting data and outputs it to the transmitting RF circuit 208. The transmitting RF circuit 208 converts the frequency of the output signal of the modulating circuit 207 and amplifies transmission power based on control of the CL transmission power control circuit 206, and transmits it as a radio signal from the antenna 201 through the duplexer 202.

Thus, desired signal power is averaged over the plurality of slots and the closed loop transmission power control is performed using the average value, making it possible to reduce a power error in desired signal power in the respective slots and to improve precision of measurement. This also makes it possible to control transmission power for each slot with high accuracy in the closed loop transmission power control of asymmetrical communication.

(Second embodiment)

The second embodiment will explain the case of the open loop transmission power control having an outer loop that controls reference power for transmission power control. FIG. 3 is a block diagram illustrating the configuration of a radio communication apparatus according to the second embodiment of the present invention. In the radio communication apparatus illustrated in FIG. 3, the

same reference numerals as those of FIG. 1 are added to the configuration portions having the same operations as those of the radio communication apparatus illustrated in FIG. 1, and the explanation is omitted.

The radio transmission apparatus illustrated in FIG.3 adopts the configuration in which an error correcting/decoding circuit 301, a CRC deciding circuit 302, and a transmission power deciding circuit 303 are added to the radio communication apparatus illustrated in FIG. 1.

The error correcting/decoding circuit 301 provides error correcting/decoding processing to an output signal of the demodulating circuit 104, and extracts received data. The CRC deciding circuit 302 performs a CRC decision to the output signal of the demodulating circuit 104. The transmission power deciding circuit 303 calculates a transmission reference power value SIRt of a communication partner using a CRC decision value outputted from the transmission power deciding circuit 303 as a reference of reception quality.

Here, generally, in the case of performing transmission using a plurality of transmission slots, in order to scatter the positions of the error bits to improve an error correction capability, interleave is performed in such a way that transmitting signals of all slots are arranged at

random. In this case, the radio communication apparatus transmits a signal indicative of transmission reference power value SIRt to the communication partner to make it possible to control transmission power of the communication partner such that the reception quality subjected to error correction processing in all slots satisfies a predetermined quality.

The radio communication apparatus, however, cannot excise control to the communication partner in response to interference amount of each slot using only transmission reference power value SIRt. This cannot reduce transmission power with respect to the slot whose interference amount is small, with the result that interference with other cells cannot be reduced.

In order to solve the above problem, the transmission power deciding circuit 303 of the radio communication apparatus adds SIR(n) of each slot to the calculated transmission reference power value SIRt to calculate a transmission reference power value SIRt(n) of each slot.

The multiplexing circuit 110 multiplexes information indicative of transmission reference power value SIRt(n)to transmitting data, and outputs the resultant to the modulating circuit 111.

FIG. 4 is a block diagram illustrating the configuration of a radio communication apparatus as

a communication partner with respect to the radio communication apparatus of FIG. 3. In the radio communication apparatus illustrated in FIG. 4, the same reference numerals as those of FIG. 2 are added to the configuration portions having the same operations as those of the radio communication apparatus illustrated in FIG. 2, and the explanation is omitted.

The radio transmission apparatus illustrated in FIG.4 adopts the configuration in which a desired signal power measuring circuit 401 for the CL transmission power control circuit 206 and an OL (Open Loop) transmission power control circuit 402 are added as compared with the radio communication apparatus illustrated in FIG. 2.

The isolating circuit 205 isolates the output signal of the demodulating circuit 204 into received data and a transmission reference power control value SIRt(n).

The desired signal power measuring circuit 401 measures desired signal power S of the known signal included in the output signal of the demodulating circuit 204, and outputs the measuring result to the OL transmission power control circuit 402. The OL transmission power control circuit 402 calculates transmission power T(n) of each slot by equation (1) shown below and controls an increase or decrease in transmission power at the transmitting RF circuit

208. It is noted that Const in equation (1) is a fixed value for gain control.

$$T(n) = SIRt(n) - S + Const \quad (1)$$

Thus, the open loop transmission power control is performed with consideration given to SIR of each slot in addition to the transmission reference power value, making it possible to control transmission power for each slot with high accuracy in asymmetrical communication.

As explained above, according to the radio communication apparatus and the transmission power control method of the present invention, since the power error in desired signal power of each slot is reduced to make it possible to improve accuracy in measurement, transmission power can be controlled for each slot with high accuracy in asymmetrical communication.

This application is based on the Japanese Patent Application No.HEI 11-286317 filed on October 7, 1999, entire content of which is expressly incorporated by reference herein.

Industrial Applicability

The present invention is suitable for use in a base station apparatus of a radio transmission system or a communication terminal apparatus.

CLAIMS

1. A radio communication apparatus that performs asymmetrical communication, said radio communication apparatus comprising:

desired signal power measuring means for measuring desired signal reception power of a plurality of slots for each slot;

interference signal power measuring means for measuring interference signal reception power;

power control information generating means for generating transmission power control information of each slot from said desired signal reception power and said interference signal reception power; and

transmitting means for transmitting said transmission power control information of each slot through one slot.

2. The radio communication apparatus according to claim 1, further comprising averaging means for calculating an average value of desired signal reception power over the plurality of slots, wherein said power control information generating means generates transmission power control information of each slot from the average value of said desired signal reception power and said interference signal reception power.

3. A radio communication apparatus that performs asymmetrical communication with the radio

communication apparatus described in claim 1, said radio communication apparatus comprising:

isolating means for isolating transmission power control information of each slot from a received signal;

transmission power controlling means for controlling transmission power of each transmission slot based on said transmission power control information of each slot; and

amplifying means for amplifying transmitting data based on control of said transmission power controlling means.

4. A radio communication apparatus that performs asymmetrical communication, said radio communication apparatus comprising:

first reception quality measuring means for measuring reception quality of the entirety of a plurality of slots;

second reception quality measuring means for measuring reception quality of each slot;

reference power calculating means for calculating transmission reference power of each slot based on said reception quality of the entirety of the plurality of slots and said reception quality of each slot; and

transmitting means for transmitting information of said transmission reference power of each slot through one slot.

5. The radio communication apparatus according to claim 4 wherein said reference power calculating means adds said reception quality of the entirety of the plurality of slots and said reception quality of each slot to calculate transmission reference power of each slot.

6. The radio communication apparatus according to claim 4, wherein said first reception quality measuring means measures said reception quality of the entirety of the plurality of slots based on a CRC checking result.

7. The radio communication apparatus according to claim 4, further comprising desired signal power measuring means for measuring desired signal reception power of the plurality of slots for each slot; and interference signal power measuring means for measuring interference signal reception power, wherein said second reception quality measuring means measures reception quality of each slot based on desired signal reception power to interference signal reception power.

8. The radio communication apparatus according to claim 7, further comprising averaging means for calculating an average value of desired signal reception power over the plurality of slots, wherein said second reception quality measuring means measures reception quality of each slot based on the average value of said desired signal reception power

and reception power of said interference signal.

9. A radio communication apparatus that performs asymmetrical communication with the radio communication apparatus described in claim 4, said radio communication apparatus comprising:

isolating means for isolating information of transmission reference power of each slot from a received signal;

transmission power controlling means for controlling transmission power of each transmission slot based on said information of transmission reference power of each slot; and

amplifying means for amplifying transmitting data based on control of said transmission power controlling means.

10. A base station apparatus mounting a radio communication apparatus thereon, said radio communication apparatus that performs asymmetrical communication comprising:

desired signal power measuring means for measuring desired signal reception power of a plurality of slots for each slot;

interference signal power measuring means for measuring interference signal reception power;

power control information generating means for generating transmission power control information of each slot from said desired signal reception power and said interference signal reception power;

and

transmitting means for transmitting transmission power control information of each slot through one slot.

11. A communication terminal apparatus mounting a radio communication apparatus thereon, said radio communication apparatus that performs asymmetrical communication comprising:

desired signal power measuring means for measuring desired signal reception power of a plurality of slots for each slot;

interference signal power measuring means for measuring interference signal reception power;

power control information generating means for generating transmission power control information of each slot from said desired signal reception power and said interference signal reception power; and

transmitting means for transmitting transmission power control information of each slot through one slot.

12. A transmission power controlling method, at one radio communication apparatus that performs asymmetrical communication, said method comprising the steps of:

measuring desired signal reception power of a plurality of slots for each slot;

measuring interference signal reception

power;

generating transmission power control information of each slot from said desired signal reception power and said interference signal reception power; and

transmitting transmission power control information of each slot through one slot,

at other radio communication apparatus, said method comprising the steps of:

isolating transmission power control information of each slot from a received signal; and

amplifying transmission power of each transmission slot based on said transmission power control information of each slot data.

13. The transmission power controlling method according to claim 12, wherein an average value of desired signal reception power is calculated over the plurality of slots, and transmission power control information of each slot is generated from the average value of said desired signal reception power and said interference signal reception power.

14. A transmission power controlling method, at one radio communication apparatus that performs asymmetrical communication, said method comprising:

measuring reception quality of the entirety of a plurality of slots;

measuring reception quality of each slot;

calculating transmission reference power of each slot based on said reception quality of the entirety of the plurality of slots and said reception quality of each slot; and

transmitting information of said transmission reference power of each slot through one slot,

at other radio communication apparatus, said method comprising the steps of:

isolating information of transmission reference power of each slot from a received signal; and

amplifying transmission power of each transmission slot based on said information of transmission reference power of each slot.

ABSTRACT

Desired signal power measured at a desired signal power measuring circuit 105 is averaged over a plurality of slots by an averaging circuit 106 to reduce a power error in desired signal power of each slot. An SIR measuring circuit 108 calculates SIR(n)of each slot from the average value of desired signal power in the plurality of slots and the measured value of interference signal power of each slot, and a TPC generating circuit 109 makes a comparison between SIR(n) of each slot and a threshold value, and generates transmission power control information. This makes it possible to control transmission power for each slot with high accuracy in asymmetrical communication.

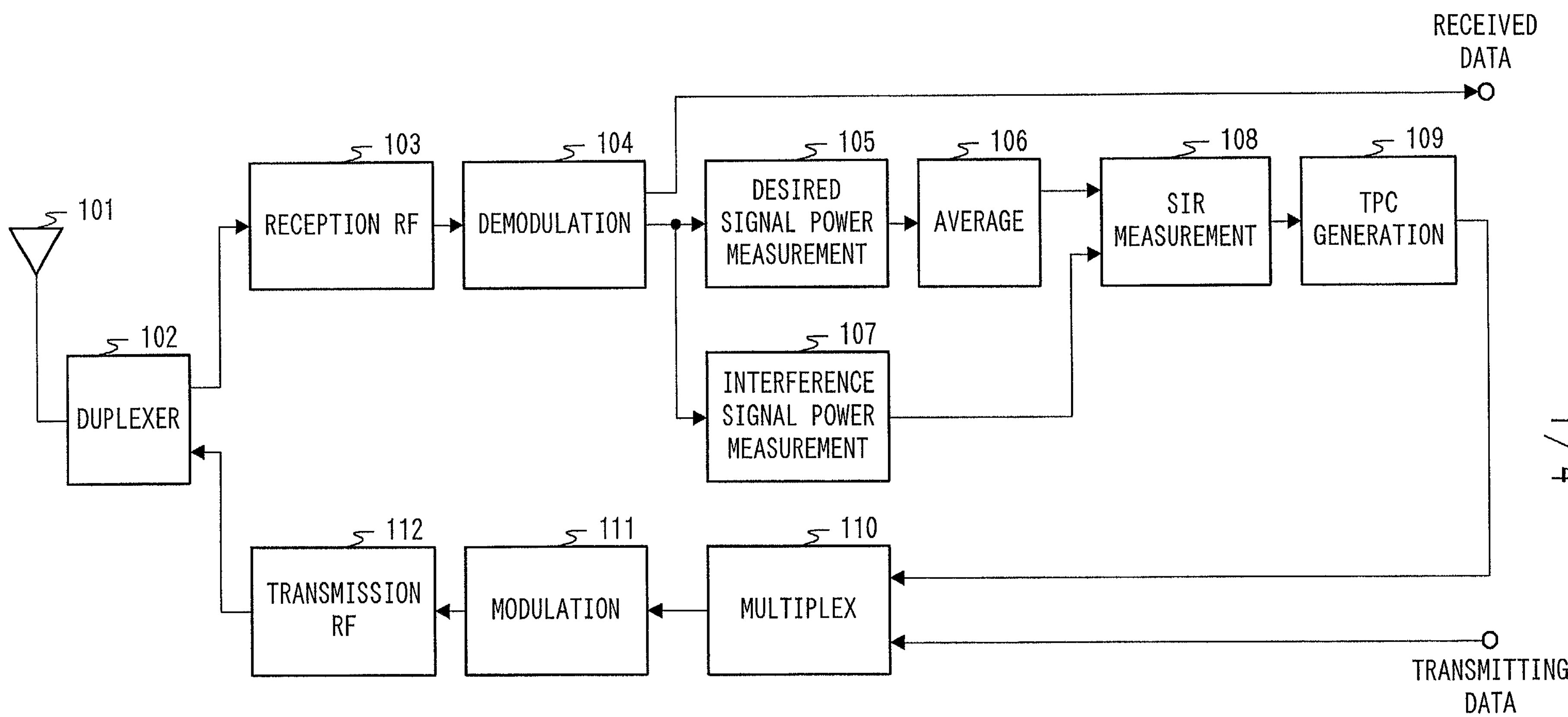
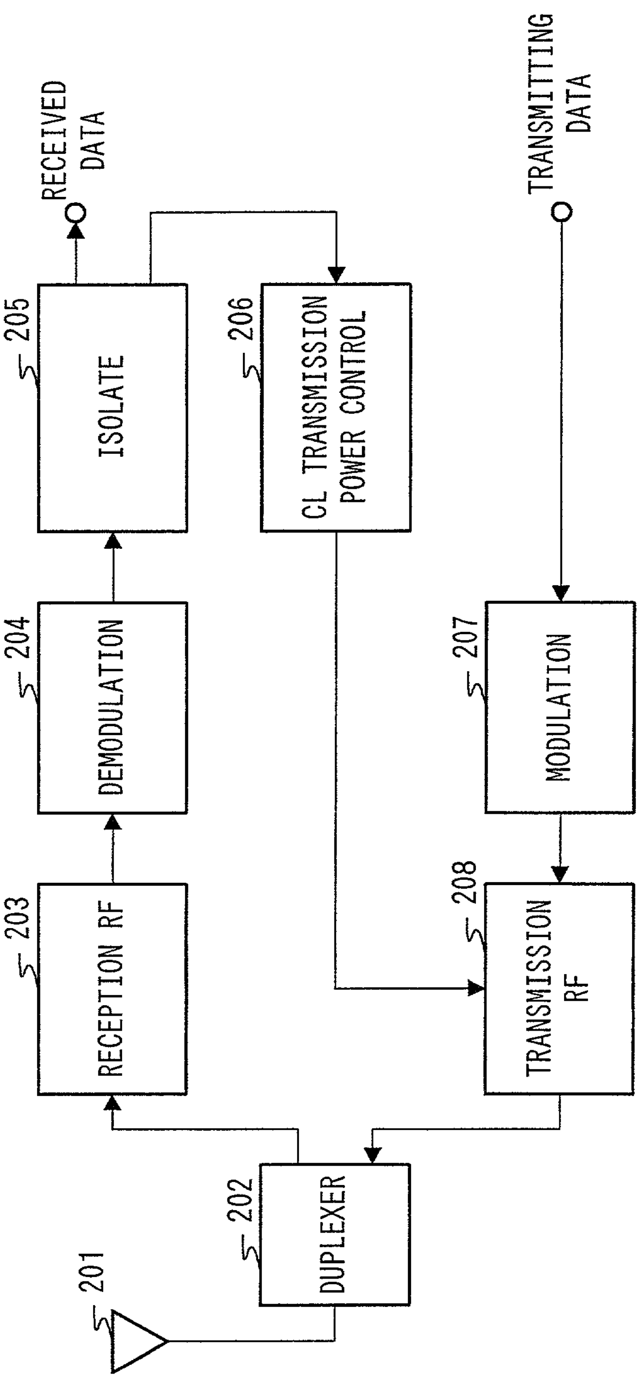

RECEIVED
DATA
101
102
DUPLEXER
103
RECEPTION RF
104
DEMODULATION
105
DESIRED
SIGNAL POWER
MEASUREMENT
106
AVERAGE
107
INTERFERENCE
SIGNAL POWER
MEASUREMENT
108
SIR
MEASUREMENT
109
TPC
GENERATION
110
MULTIPLEX
111
MODULATION
112
TRANSMISSION
RF
TRANSMITTING
DATA

FIG. 1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TRANSMITTING DATA
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ISOLATE
206
CL TRANSMISSION POWER CONTROL
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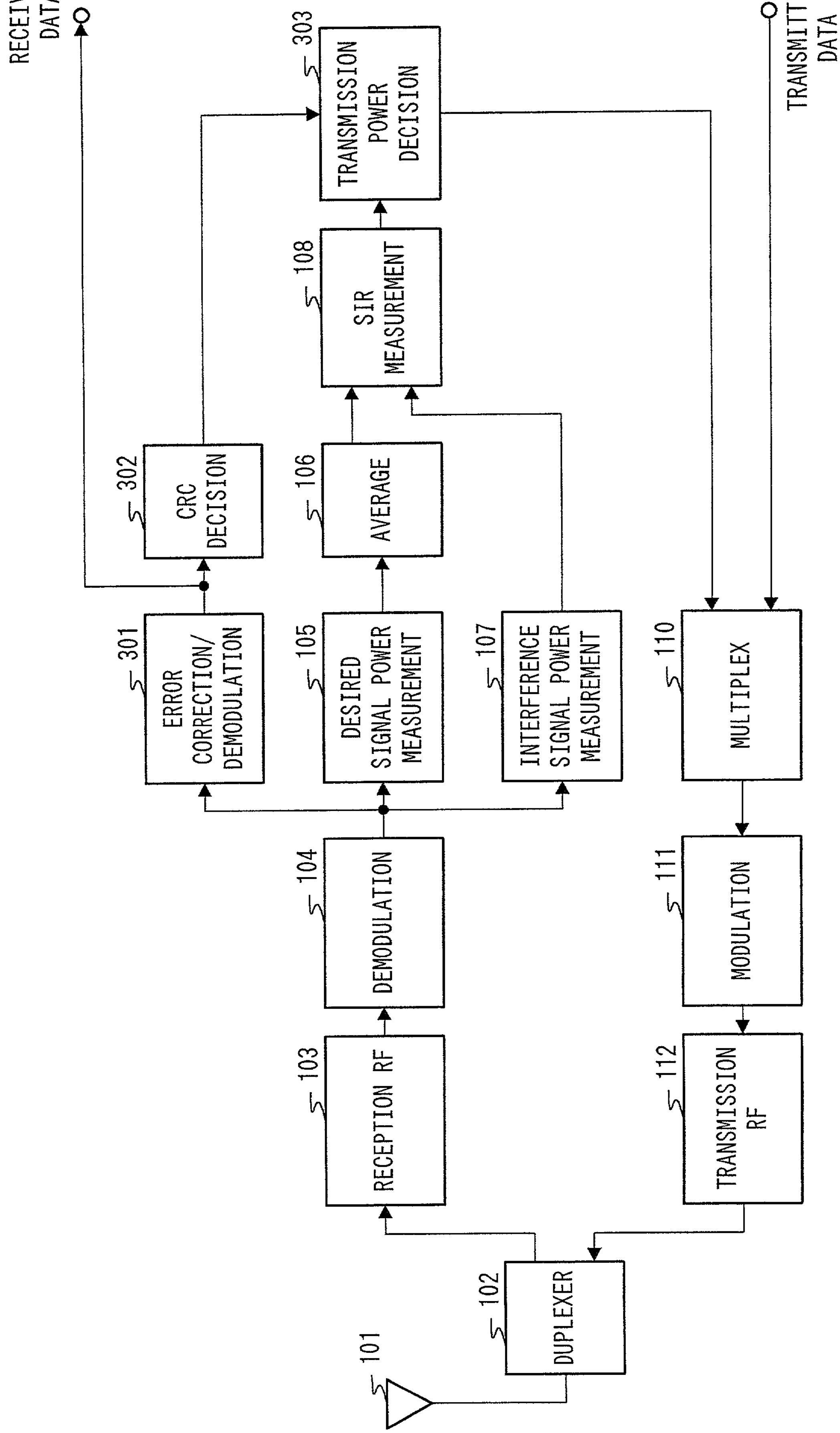
207
MODULATION
203
RECEPTION RF
208
TRANSMISSION RF
202
DUPLEXER
201

FIG. 2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TRANSMISSION POWER DECISION
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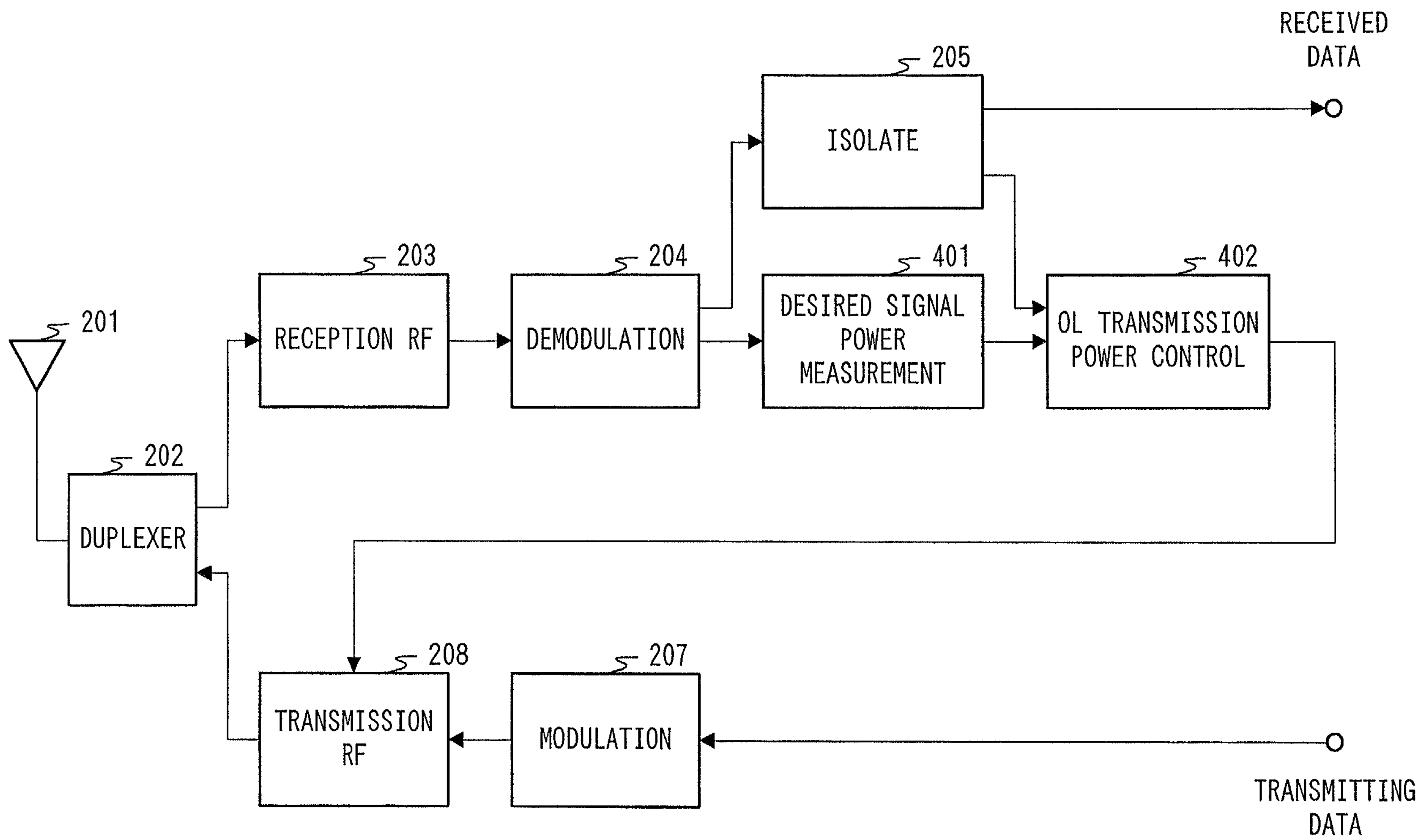
TRANSMITTING DATA
SIR MEASUREMENT
108
CRC DECISION
302
AVERAGE
106
ERROR CORRECTION/ DEMODULATION
301
DESIRED SIGNAL POWER MEASUREMENT
105
INTERFERENCE SIGNAL POWER MEASUREMENT
107
MULTIPLEX
110
DEMODULATION
104
MODULATION
111
RECEPTION RF
103
TRANSMISSION RF
112
DUPLEXER
102
101

FIG. 3


RECEIVED DATA
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ISOLATE
203
RECEPTION RF
204
DEMODULATION
401
DESIRED SIGNAL POWER MEASUREMENT
402
OL TRANSMISSION POWER CONTROL
201
202
DUPLEXER
208
TRANSMISSION RF
207
MODULATION
TRANSMITTING DATA

FIG. 4

APPLICATION FOR UNITED STATES PATENT
Declaration for Patent Application

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name.
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on

the invention entitled: RADIO COMMUNICATION APPARATUS AND TRANSMISSION POWER CONTROL METHOD

the specification of which 2 (file no ____________)

(check at least one)
3 [X] is attached hereto
4 [ ] was filed on ________ as (5) U.S. Application Serial No. ________
6 [ ] and was amended ________
(if applicable)

Use this portion only if you are entering the U.S. National phase based on a PCT International Application designating the U.S.		
	7 [x]	was filed as PCT international application
	8	Number PCT/JP00/06973
	9	on October 6, 2000
		and was amended under PCT Article(s) 19 and/or 34
	10	on ________ (if applicable).

I hereby declare that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended, by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me which is material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application (s) for patent or inventor's certificate listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date earlier than that of the application(s) on which priority is claimed.

Prior (Foreign) Application(s) any Priority Claims Under 35 U.S.C. 119 — Priority Claimed

	(Country)	(Number)	(Day/Month/Year Filed)	Yes	No
11a	JAPAN	JP11-286317	7/10/1999	[x]	[ ]
				[ ]	[ ]

[ ] Additional foreign application numbers are listed on a supplemental priority data sheet attached hereto.

Priority Claim(s) from U.S. Provisional Application(s) – I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below:

11b

Application No.	Day/Month/Year Filed	Application No.	Day/Month/Year Filed

Do not use this portion to identify a PCT application if the parent application is the U.S. National phase of the PCT application	I hereby claim the benefit under Title 35, United States Code, 120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56 which became available between filing date of the prior application and the national or PCT international filing date of this application. 13 (U.S. Application Number) (U.S. Filing Date) Status (patented, pending, abandoned)

I hereby appoint the following attorneys of the firm of Stevens, Davis, Miller & Mosher, L.L.P. as my attorneys of record with full power of substitution and revocation to prosecute this application and to transact all business in the Patent and Trademark Office:

(3) James E. Ledbetter, Reg. No. 28732; Thomas P. Pavelko, Reg. No. 31689; and Anthony P. Venturino, Reg. No. 31674.

ALL CORRESPONDENCE IN CONNECTION WITH THIS APPLICATION SHOULD BE SENT TO STEVENS, DAVIS, MILLER & MOSHER, L.L.P., 1615 L Street, N.W., Suite 850, Washington, D.C. 20036, TELEPHONE (202) 408-5100, FACSIMILE (202) 408-5200.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful statements may jeopardize the validity of the application or any patent issuing thereon.

PAGE 2 OF U.S.A. DECLARATION FORM

14a	Typewritten Full Name of Sole or First Inventor 1-0	**Katsuhiko** (Given Name)	(Middle Name)	**HIRAMATSU** (Family Name)
15a	Inventor's Signature	Katsuhiko		Hiramatsu
16a	Date of Signature	May (Month)	23 (Day)	2001 (Year)
17a	Residence	**Yokosuka-shi** (City)	**Kanagawa** (State or Province)	**JAPAN** (Country) JPX
18a	Citizenship	**JAPAN**		
19a	Post Office Address *(Insert complete mailing address, including country)*	**2-56-14-1212, Kinugasasakae-cho, Yokosuka-shi, Kanagawa 238-0031 JAPAN**		
14b	Typewritten Full Name of Sole or First Inventor	Given Name	Middle Name	Family Name
15b	Inventor's Signature			
16b	Date of Signature	Month	Day	Year
17b	Residence	City	State or Province	Country
18b	Citizenship			
19b	Post Office Address *(Insert complete mailing address, including country)*			
14c	Typewritten Full Name of Sole or First Inventor	Given Name	Middle Name	Family Name
15c	Inventor's Signature			
16c	Date of Signature	Month	Day	Year
17c	Residence	City	State or Province	Country
18c	Citizenship			
19c	Post Office Address *(Insert complete mailing address, including country)*			
14d	Typewritten Full Name of Sole or First Inventor	Given Name	Middle Name	Family Name
15d	Inventor's Signature			
16d	Date of Signature	Month	Day	Year
17d	Residence	City	State or Province	Country
18d	Citizenship			
19d	Post Office Address *(Insert complete mailing address, including country)*			

*Note to Inventor: Please sign name on line 15 exactly as it appears in line 14 and insert the actual date of signing on line 16. If there are more than four inventors, please add a copy of this page for identification and signatures for the additional inventors.